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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,384	12/06/2001	Gary F. Feierbach	04860P2679	2221

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EXAMINER

DATSKOVSKIY, MICHAEL V

ART UNIT	PAPER NUMBER
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2835

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/020,384

**Applicant(s)**

FEIERBACH, GARY F.

**Examiner**

Michael V Datskovskiy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5,7,9-35,42,43,45 and 46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-5,7,9-35,42,43,45 and 46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 7 is objected to because of the following informalities: The claim depends on the canceled claim 6. Appropriate correction is required. For the sake of a further prosecution of the claim it will be conditionally considered as being depended on the claim 1.

2. Claims 45-46 are objected to because of the following informalities: The claims depend on the canceled claim 44. Appropriate correction is required. For the sake of a further prosecution of the claims they will be conditionally considered as being depended on the claim 43.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 14, 30 and 32-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Regarding to the claim 14: claiming an absence of a fluid in a system is equal to proclaiming said system to be under a complete vacuum, which is theoretically possible but practically unreachable. Regarding to the claim 30: Logically, a closed end of a flexible bellow can be a thin membrane. However it is not

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clear, how such a membrane can be attached to the already existing interior surface of said closed end of the bellow to be a heat sink. There is no support for such a structure in the specification. Regarding to the claims 32-35: The parent claim 1 was last time amended to further provide a cooling device with: "a port for coupling to a pump coupled to said conduit configured to reduce a pressure in said conduit and said flexible channel to compress said flexible channel and to remove said conductive material from said integrated circuit". Thus, claims 32-35 claiming a conduit as a heat pipe are contradictory to the parent claim 1, because a heat pipe by a default is a hermetically sealed two-phased cooling device comprising a liquid and a vapor, and is not connected to any pump. Furthermore in the specification (page 19, last paragraph and page 20, first paragraph) applicant described a cooling device with a conduit comprising a heat pipe, wherein the internal pressure approximates the external pressure of about 1,0 atmosphere, and a contact between a cooling device and IC"s is achieved by moving a PCB with IC"s or the whole cooling device against each other. Also, regarding to the claim 35: Claim 35 recites the limitation "said gas" in line 1. There is insufficient antecedent basis for this limitation in the claim, and, based on what was mentioned above, it is not clear what kind of a gas can be inside a heat pipe.

### ***Response to Arguments***

5. Applicant's arguments filed 02/13/2004 have been fully considered but they are not persuasive. First: As it was explained above, an added feature makes some claims contradictory to the parent claim 1. Second: It is inherent, that any cooling/heating system having a pump moving a cooling/heating gas in a loop with a

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higher pressure, would be always able to create either a higher or lower pressure. (As well as the applicant, examiner won't provide a detailed explanation, how it could be achieved technically). Based on the above assumption, examiner has to point out, that now, adding of such a feature to the cooling device comes to claiming a new intended use of a known device, which is usually not patentable. Third: Yamamoto et al in Figs. 24-30 teach a structure without soldering between a heat sink and an IC, including a heat sink -membrane in Fig.30. Hence, the previous rejection over the prior art could be sustained. However, considering a new ground of rejection under 35 U.S.C. 112 first paragraph, and in order to eliminate any doubts about a lack of the novelty of such newly claimed intended use, examiner provides the following rejection, based on a newly discovered prior art, comprising a similar structure and a method of changing a pressure in a flexible bellow having a heat sink at its far end in order to move it into and out of contact with an IC.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-3, 11, 14-16, 18-19, 21-24, 29, 31, 42 (claims 14 as best understood by examiner) are rejected under 35 U.S.C. 102(b) as being anticipated by Dowing.

Dowing teaches a cooling device 10, Figs.1-2, for removing heat from an integral circuit (IC), said cooling device comprising: a conduit 12; a sealed flexible channel 17 having a first open end and a second thermally conductive closed end 23, 28, said flexible channel is made of a resilient material having spring-like characteristics and providing a spring-like restoring force when compressed, said second end thermally conductive material having a substantially planar surface to interface directly with said IC when said flexible channel is extended; an interconnect openings between said flexible channel and said conduit to allow a fluid to move between said conduit and said flexible channel; and a port 22 for coupling to a pump coupled to said conduit, wherein when said pump reduces a cooling fluid pressure (or inherently empties a system completely), said flexible channel compresses and removes from said IC and when said pump increases a cooling fluid pressure said flexible channel expands and moves toward said IC to contact it and to dissipate a generated heat (col.4, lines 58-68). Dowing teaches furthermore a cooling device comprising a heat sink 18 having plurality of flow diverters - fins 19, said heat sink being attached to an interior surface of said closed end to conduct heat absorbed by said closed end through said heat sink to said cooling fluid contained within said conduit 12 and said flexible channel 17.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 4-5, 7, 9-10, 12-13, 17, 25-28, 43 and 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dowing.

Dowing teaches all the limitations of the claims except certain types of materials used to couple said flexible channel to said conduit (claims 4-5), or to make said flexible channel and its thermally conductive closed end (claims 7, 9, 10); and certain ranges of the cooling fluid pressure to manipulate expanding or compressing of said flexible channel (claims 12-13, 17, 25-28, 43 and 45-46). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make said closed end heat sink and said flexible channel from such claimed materials, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, (*In re Leshin*, 125 USPQ 416), and also it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

10. Claims 32-35 as best understood by examiner are rejected under 35 U.S.C. 103(a) as being unpatentable over Dowing as applied to claims above, and further in view of Novotny.

Considering provided above claims 32-35 rejection under 35 U.S.C. first paragraph as being contradictory to the parent claim 1 and without support in the specification (due to the last amendment), the following rejection will conditionally regard the claim 1 without the last amendment.

Dowing teach all the limitations of the claims except said conduit is a heat pipe comprising a cooling fluid and a vapor, and connected to a reservoir containing said cooling fluid. Dowing teaches furthermore a cooling device comprising a heat sink 20 having plurality of fins, said heat sink being attached to an interior surface of said closed end to conduct heat absorbed by said closed end through said heat sink to said cooling fluid contained within said conduit 14 and said flexible channel 10. Novotny teaches a cooling device, Figs.1-4, for removing heat from an integral circuit 12 (IC), said cooling device comprising: a conduit 14; a sealed flexible channel 10 having a first open end and a second thermally conductive closed end 26, 28, said flexible channel is made of a resilient material, said second end thermally conductive material having a substantially planar surface to interface directly with said IC 12; an interconnect openings between said flexible channel and said conduit to allow a fluid to move between said conduit and said flexible channel 10; and a reservoir 19 coupled to said conduit 14. It would have been obvious to one having ordinary skill in the art at the time the invention was made

to employ a heat pipe as a conduit, as Novotny shows it, in the device by Dowing in order to enhance heat dissipation.

11. Claims 20 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dowing as applied to claims above, and further in view of Yamamoto et al (US Patent 4,920,574).

Dowing teach all the limitations of the claims except said fluid is heated (claim 20) and said heat sink is a thin membrane (claim 30). Yamamoto et al teach the similar to the claimed by the applicant structure, including an embodiment (Fig. 13) providing a heater 63; and an embodiment (Fig.30) providing a thin membrane heat sink 3. It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a heater as it is shown by Yamamoto et al in the device by Dowing in order to heat an IC (as a testing, probably); or to employ a heat sink in shape of a thin membrane as it is shown by Yamamoto in the device by Dowing, in order to decrease a heat resistance between an IC and a cooling fluid.


12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yamamoto et al (US Patent 4,729,060); Kikuchi et al (US Patent 4,712,158); Mittal (US Patent 4,750,086); Eastman et al (US Patent 4,561,040); Tustanivskiy et al (US Patent 4,879,629); Moriizumi et al (US Patent 4,949,219); Grunfeld (US Patent 5,847,366) and Meeker et al (US Patent 4,138,692).

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13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V Datskovskiy whose telephone number is (571) 272-2040. The examiner can normally be reached on 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on ((571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
03/05/04

Michael V Datskovskiy  
Primary Examiner  
Art Unit 2835